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| **Physical and Chemical Changes** |
| Precautions: Safety glasses, safety aprons,   DO NOT look directly at the burning magnesium. |
| Objective: To study the difference between a physical and a chemical change. |
| Apparatus: Bunsen burner, crucible tongs, medium test tubes, ceramic tile, mortar and pestle |
| Materials: Wood splints, copper strip, magnesium ribbon, sandpaper, sugar, glass rod, table salt |
| Procedures: |

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| 1.    . | Examine a wood splint and note its physical properties in the table below. Heat the splint until it takes fire and allow it to burn itself out on the ceramic tile. Record your observations in the table below. |
| 2. | Using a test tube holder, heat 1/6 of a test tube of water in a test tube until it boils. Hold a dry test tube in the escaping steam for a minute or two. What is the product that condenses on the tube? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Record your observations in the table below. |
| 3. | Scour a piece of copper with sandpaper until it is perfectly clean. Examine it and note its properties. Hold the copper strip with the tongs and heat it in the Bunsen burner for several minutes. Examine and note its properties after heating. Record your observations in the table below. |
| 4. | Put a pinch of sugar in a dry test tube. Heat the test tube for several minutes. Note the properties of the sugar before and after heating. Record your observations in the table below. |
| 5. | Heat the end of a glass rod until it becomes soft and bends. When cool, examine and compare the heated with the unheated end of the rod. Record your observations in the table below. |
| 6. | Clean the magnesium ribbon with sandpaper. examine the magnesium and note its properties. Hold the magnesium strip with the tongs and ignite it in the Bunsen burner. |
| 7. | Taste some salt. Place 1/2 cm3 of salt in a clean mortar and pestle and grind it to a powder. Taste the ground salt. Dissolve some of the salt in « test tube of water. Taste the solution. Record your observations in the table. |
|  | Observations:   Table of Observations |

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| Materials | Properties Before Heating | Properties After Heating | Chemical or Physical Change? |
| Wood |  |  |  |
| Water |  |  |  |
| Copper |  |  |  |
| Sugar |  |  |  |
| Glass |  |  |  |
| Magnesium |  |  |  |

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| Salt | Taste of          Crystals | Taste when          Ground | Taste when       Dissolved |
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| Summary Questions: |
| 1. Different kinds of matter are recognized by observing their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| 2. Five characteristics or properties used to identify substances are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| 3. Two kinds of changes that matter may undergo are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| 4. A change in which a substance loses the properties by which we identify it is called a  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ change. |
| 5. A change in which an element or compounds may change some of its physical properties but not  its chemical properties is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ change. |
| Conclusions: |
| 1. A chemical change is one in which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| 2. Compounds are formed as the result of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes. |
| 3. A physical change is one in which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 4. The formation of mixtures is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ change. |
| Related Questions: |
| 1. Matter is defined as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| 2. The three states or forms of matter are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| 3. Mixing iron fillings and sulphur is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ change because \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 4. Heating a mixture of iron filings and sulphur produces a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ change because  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 5. State whether the following are Physical (P) or chemical (C) changes:  a) Souring of milk \_\_\_\_\_\_\_                           g) Burning of coal \_\_\_\_\_\_\_  b) Rusting of iron \_\_\_\_\_\_\_                            h) Pulverizing sugar \_\_\_\_\_\_\_  c) Breaking glass \_\_\_\_\_\_\_                            i) Boiling water \_\_\_\_\_\_\_\_  d) Tarnishing of silver \_\_\_\_\_\_\_                     j) Melting ice \_\_\_\_\_\_\_\_  e) Dissolving salt in water \_\_\_\_\_\_                k) Melting paraffin \_\_\_\_\_\_\_  f) Magnetizing iron \_\_\_\_\_\_\_                         l) Decaying of food \_\_\_\_\_\_\_ |
| 6. Does the application of heat to a substance always produce a chemical change? \_\_\_\_\_\_\_ Give  examples to support your answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 7. Give an example of a chemical change produced by:  a) Light \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  b) Electricity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  c) Heat \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 8. Give an example of a chemical change which produces:  a) Light and Heat \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  b) Electricity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  c) Mechanical energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 9. How would you show that:  a) dissolving sugar in water is a physical change.  b) heating a platinum wire in air is a physical change. |